SLS SYS 200

PROCESSOR SETTINGS

Crossover Section	Frequency Hz	Slope	Delay/msec[1]	Gain/dB[2]	Phase
CSB215 (HPF)	35Hz	24dB Oct. (4th order) Butterworth	0	-1dB	In
CSB215 (LPF)	200Hz	24dB Oct. (4th order) Linkwitz/Riley	0	-1dB	In
CS200MH (HPF)	200Hz	24dB Oct. (4th order) Linkwitz/Riley			

EQ Section[3]	Frequency Hz	Q	Bandwidth[4]	Level/dB
CSB215 LF	38Hz	2	.71	+5dB
CS200MH HF/MF	420Hz	3	.48	+4dB
	500Hz	1.41	1	+3dB
	620Hz	4	.36	-3dB
	1,100Hz	2.14	.67	+3dB
	1,300Hz	6	.24	+2dB
	3,500Hz	1.41	1	+3dB

Limiting Section[5]	Threshold Voltage	Attack/msec	Release/msec	Peak Stop Voltage
LF	56.6V	16msec	256msec	97V
HF/MF	53V	2msec	32msec	89V

*Due to product improvement research, SLS Audio reserves the right to make changes to existing products without notice.

1. Some DSP units will change the propagation delay for each output depending on how much processing is on that channel

2. Assumes amplifiers have equal voltage gain

3. Equalization Settings were developed in an anechoic environment
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4. Different DSP processor manufactures are not consistent in their implementation of digital parametric EQs. The SLS recommended filters will not be replicated by all DSP devices. If the DSP device that is used continuously varies the Q value of the filter depending on the +/- dB level, the DSP will not match our settings. (Most of these devices do not allow filter Q to be shown at all.)

5. See Application Note “Setting System Limiters”

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Setting System Limiters

PROPERLY SETTING UP SYSTEM LIMITERS

Properly setting up system limiters to protect your loudspeaker while providing for maximum performance can be a challenge when the DSP/amplifier/loudspeaker hardware are all variables. The technique below will provide for a limiter setting threshold that should protect loudspeakers from the majority of use cases, however the driver(s) may still be vulnerable to content such as sustained feedback or large, low-frequency transients below box tuning. Good system design and common sense should be the rule.

1. Obtain a source to generate pink noise and a true RMS voltage meter that has a bandwidth to at least 20kHz, and can average the reading over at least 10 seconds.

2. Complete the room tuning and set the amplifier gain. For prevention of future user-error, having the amps set at full gain should be considered unless the amplifier gain setting is hardware or software protected; in which case, the amplifier gain(s) can be optimized for best signal to noise performance.

3. After the room tuning is done and the amp gains are set, bypass the limiter on the DSP unit being used for protection, but leave all other DSP functions for that output engaged (such as HPF, crossover, EQ, etc).

4. Mute all system outputs but the one that is being calibrated. Place the voltage meter across the amplifier +/- output terminals and turn up the pink noise source until the meter reads just above the specified RMS voltage rating for that driver/system and its recommended processor settings. Only play the pink noise long enough to get a stable average of the RMS voltage reading (for high frequency drivers typically 5 seconds and for full range loudspeakers or subwoofers, typically 10 seconds).

5. Set the limiter to a minimum of a 100:1 ratio and input manufacturer suggested attack and release times. Engage the limiter and decrease the threshold until the voltage is lowered to the rating specified (without changing the gain of the pink noise).

6. Repeat the above procedure for each driver and/or passive loudspeaker being used.

7. If a predictive peak stop limiter is available on the DSP, engage at 6dB above the RMS setting. Monitor for amplifier clipping and if it occurs during system use, lower the peak-stop threshold until the amplifier is just into clipping. As an alternative, engage the self-contained limiter circuit in the amplifier if it has one.

This only needs to be done once as long as the amplifier/limiter combination does not change. However, any change of the amplifier gain will modify the limiter’s action. If the amplifier gain is decreased, protection will engage early, limiting driver output. If the amplifier gain is increased, protection will engage only after the driver is above the safe RMS voltage.

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